CHAPTER 9

COURSE MATERIALS

INTRODUCTION

Course materials are the tools used to lay the foundation, prepare the framework, and construct the bridge over which your students must pass to attain the knowledge and skills defined by the objectives of the course. Course materials include lesson plans, instruction sheets, and instructional media. You must be proficient in the use of all course materials to conduct effective instruction. These three, however, are the primary materials you will use in presenting instruction.

LESSON PLANS

The lesson plan is the most important document available to you as an instructor. Specifically, it is the blueprint that ensures instruction is presented in proper sequence and to the depth required by the objectives. The lesson plan accomplishes the following:

- Ensures you have considered all factors necessary to conduct a safe and effective lesson
- Guides you in conducting lesson activities
- Helps you maintain a constant check on your activities and your students' progress
- Standardizes instruction
- Informs training managers of what is being taught

The format of lesson plans differs somewhat depending on how they were developed. However, the major elements are common to most lesson plans you will use.

FRONT MATTER

The front matter of a lesson plan provides essential information regarding the course of instruction. You must read and understand this information to comply with the course developer's intent regarding instruction.

LESSON TOPICS

The lesson topics are the documents from which you conduct each lesson. They include required instructor preparation and an outline of the instruction. The lesson topic consists of

live basic elements. You must have a complete understanding of each element and its purpose in the lesson topic to be able to teach the knowledge and skills identified by the learning objectives. The elements and instructor actions are as follows:

- Introduction
- Presentation
- Review and summary
- Application
- Assignment

Introduction

The introduction is one of the most crucial elements of the lesson. During the introduction, you introduce yourself and the topic, state the learning objectives, make motivating statements, and provide a topic overview. As a part of the motivating statement, you should explain why the students need to learn the material and how they will apply it on the job. Besides telling students how and why the lesson is important, you must show your own motivation and enthusiasm toward the information. From the students' perspective, the introduction builds emotional involvement, arouses interest, promotes motivation, builds a sense of purpose, and focuses attention on the subject matter.

Presentation

The presentation element is the main body of the lesson. It is when you teach and otherwise explain the objectives of the lesson. Properly prepared and taught, the presentation serves to build student understanding of facts, procedures, rules, and principles.

Review and Summary

The review and summary element of the lesson provides you with an opportunity to summarize the topic's major points. You review the lesson to reinforce learning and to get valuable feedback on what learning has taken place. To get this feedback, you must ask questions that require your students to think and to respond beyond the recall level of learning.

Application

This element enables the student to apply the knowledge to a physical or mental skill. It allows students to practice their skills, use the material they have learned, and get feedback about their knowledge and skill. You evaluate the students' performance as they perform the skill. You provide reinforcement and feedback to each student by pointing out student errors and suggesting how to correct them. The application element is used with topics teaching a skill.

Assignment

You use the assignment element to provide students with practice of the lesson information or prepare them for the next lesson.

LESSON PLAN PERSONALIZATION

You will be provided with the approved lesson plan for the course you instruct. Add your own personalization to tailor the lesson plan to your style of teaching. Lesson plan personalization provides the information you need to make the instruction uniquely yours without deviating from the approved course of instruction.

Types of Personalization

Personalization includes adding subject matter detail needed to cover the topic discussion points to the required depth. Also add notes to indicate when you want to stress a point, relate a personal experience, or use an example or analogy.

Subject Matter Detail. Use this type of information to provide technical data such as purposes, descriptions, facts, operations, and functions. Course reference materials provide this information.

Instructional Techniques. Use carefully written questions, well-planned visual aids, or additional student/instructor activities to enhance the lesson.

Personal Experiences. Relate your own on-the-job experiences to the lesson to increase student interest. Relating your personal experiences has the positive effect of reinforcing the practical application of the material. It also serves to increase student interest and motivation.

Examples and Analogies. When possible, support main points of the lesson plan by examples and analogies to simplify the concepts or ideas being taught. Use them as a part of your personalization of each lesson. For example, suppose your lesson is on the way sound waves travel through air, but your class has difficulty understanding that concept. Then perhaps an analogy such as “it is similar to the way ripples travel after a stone is dropped in water” will help them understand.

Steps of Personalization

When personalizing the lesson plan, follow these specific steps:

- Read the learning objectives to obtain an understanding of what the objectives are trying to achieve.
- Read through the entire lesson plan to gain an understanding of the contents.
- Research the reference materials to obtain subject matter detail needed to support the major discussion points.
- Observe a qualified instructor’s presentation of the lesson and discuss it with him or her before personalizing the topic.
- Personalize the lesson plan. By understanding the requirements of the objectives, you can

put into your own words the information that will help you present the lesson.

- Update personalization as necessary. Review your lesson plan personalization for completeness and accuracy each time you teach.

The lesson plan provides you with the necessary support to effectively teach all required information.

INSTRUCTION SHEETS

In addition to the lesson plan, use instruction sheets to provide students with information or directions they need to complete a particular course of study. You can use them to convey to students certain detailed information, instructions for a task, or a learning activity they must undertake. You may use six types of instruction sheets: assignment, diagram, information, job, problem, and outline. When a course requires a large number of instruction sheets, they are normally combined into a document known as a trainee guide.

ASSIGNMENT SHEETS

Assignment sheets (fig. 9-1) are designed to direct the study or homework efforts of a student. Assignment sheets simplify the students' search for relevant data and direct their efforts to the proper source. The sheets may direct students to information contained in various manuals; reference documents; or, in some cases, other instruction sheets. Each assignment sheet is divided into four sections: the introduction, the topic learning objectives, the study assignment, and the study questions.

Introduction

The introduction provides information on the purpose of the topic,

Topic Learning Objectives

The assignment sheet lists the topic learning objectives, which are identical to the objectives in the applicable lesson plan.

Study Assignment

The study assignment tells the students what they must do to complete the assignment. If the assignment requires students to read the reference material, it identifies the paragraph, page, figure, and diagram numbers. If it requires some other activity, it gives students directions for completing the activity.

Study Questions

Study questions help students comprehend their assignment and check their ability to apply the information.

ASSIGNMENT SHEET 4-1-2-1

GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

INTRODUCTION

This lesson will show how the AN/BRR-6 operates and its effect on the system as a whole.

TOPIC LEARNING OBJECTIVES

Upon successful completion of this topic, you will be able to:

1. State the functions of the AN/BRR-6.
2. State that the AN/BRR-6 consists of the following major functional areas. Include the function of each to support normal operations.
   a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
   b. Receiver Group OR-197/BRR-6
   c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
   d. Buoy Cradle MT-4905/BRR-6
   e. Reeling Machine RL-275/BRR-6
   f. Sensor Group OA-8906/BRR-6
   g. Buoy Door Sensing Switch
   h. Buoy Control Indicator C-0256A/BRR-6
   i. Antenna Control Indicator C-10257/BRR-6
   j. Buoy Depth Control Indicator C-10258A/BRR-6
   k. Relay Assembly RE-1115/BRR-6
   l. Interconnecting Box J-3461/BRR-6
   m. Towed Array Control Indicator Panel
3. Define the abbreviations and terms used with the AN/BRR-6 to support all operations and preventive maintenance.
4. State the operational characteristics and capabilities of the AN/BRR-6 to support all operations and preventive maintenance.
5. State the security requirements for the AN/BRR-6 to support all operations and preventive maintenance.
6. Describe all major and associated components of the AN/BRR-6 to support all operations and preventive maintenance. Include names, nomenclature, physical appearance, reference designators, locations, and construction features.

Figure 9-1. Example Assignment Sheet. (Sheet 1 of 3)

a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)

b. Receiver Group OR-197/BRR-6

c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6

d. Buoy Cradle MT-4905/BRR-6

e. Reeling Machine RL-275/BRR-6

f. Sensor Group OA-8906/BRR-6

g. Buoy Door Sensing Switch

h. Buoy Control Indicator C-10256A/BRR-6

i. Antenna Control Indicator C-10257/BRR-6

j. Buoy Depth Control Indicator C-10258A/BRR-6

k. Relay Assembly RE-1115/BRR-6

l. Interconnecting Box J-3461/BRR-6

m. Towed Array Control Indicator Panel

7. Describe the controls and indicators directly associated with the AN/BRR-6 to support all operations and preventive maintenance. Include names, reference designators, positions, conditions, colors, locations, and functions.

8. Describe how the AN/BRR-6 works (functional operation) to support all operations and preventive maintenance. Include signal flow, sequential operation, and indications.

a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)

b. Receiver Group OR-197/BRR-6

c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6

d. Buoy Cradle MT-4905/BRR-6

e. Reeling Machine RL-275/BRR-6

f. Sensor Group OA-8906/BRR-6

g. Buoy Door Sensing Switch

h. Buoy Control Indicator C-10256A/BRR-6

i. Antenna Control Indicator C-10257/BRR-6

j. Buoy Depth Control Indicator C-10258A/BRR-6

k. Relay Assembly RE-1115/BRR-6

l. Interconnecting Box J-3461/BRR-6

m. Towed Array Control Indicator Panel

9. Describe the functional interface between the AN/BRR-6 and related external equipments to support all operations and preventive maintenance.

a. Power sources

b. Input signals

c. Output signals

Figure 9-1. Example Assignment Sheet. (Sheet 2 of 3)

STUDY ASSIGNMENT

1. Study EE125-FA-MMF-010/E110-BRR-6, FOMM Technical Manual Support Volume for Radio Receiving Set AN/BRR-6, Volume 1, glossary; tables 1-1 and 2-1 through 2-7; paragraphs 1-1, 1-2, 1-2.1 through 1-2.12, and 1-3 through 1-6; and figures 2-1 through 2-8, 5-1, and 5-3.
2. Study NAVSEA S9SSB-X9-SSM-900/(U)726V6P3B13 (SSM V76P3B13), Habitability, Ship Handling, and Emergency Systems Operating Instructions, 01637-11, paragraph 1-1.

STUDY QUESTIONS

1. How many units comprise the BRR-6?
2. What is the frequency range of the BRR-6?
3. What is the maximum speed allowable for towing the buoys'?
4. What is the maximum speed for launching a buoy?
5. Is it good practice to stream the buoyant cable and fly a buoy at the same time?
6. How many buoys are associated with each BRR-6?
7. What is the minimum depth for launching a buoy'?
8. How much cable does each cable have?
9. What does FOMM mean?
10. Which units of the BRR-6 are located in the IRR?
11. Which units of the BRR-6 are located in the Command and Control Center?
12. How many antennas are associated with the Towed Buoy?
13. What is the purpose of the Depth and Destruct Canister? Where is it located?
14. Which unit controls all the buoy electronics?
15. How close to the surface must the buoy be before Unit 10 can take over depth control?
16. How does Unit 9 (Towed Buoy Antenna Control Unit) communicate with the buoy electronics'?
17. Where are the tow cable cutters located?
18. Where does the BRR-6 receive its 115 vac 60 Hz power from?
19. Do the navigation center signals go through the AIS cabinet in the IRR?

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Figure 9-1. Example Assignment Sheet. (Sheet 3 of 3)

DIAGRAM SHEETS

Diagram sheets (fig. 9-2) provide students with illustrative material or with material to support other instruction sheets. They provide the student with a diagram, schematic, or illustration to eliminate the need for the student to copy such information during the lesson.

INFORMATION SHEETS

Information sheets (fig. 9-3) provide information related to subject matter contained in texts or references required for the course but not readily available to students. Each information sheet contains three sections: the introduction, references, and information.

Introduction

The introduction provides a general explanation of how or why an understanding of the covered material benefits the students.

References

The references section consists of a listing of all publications used to develop the information. Each reference fully identifies the document by number, volume, part, and complete title, as applicable.

Information

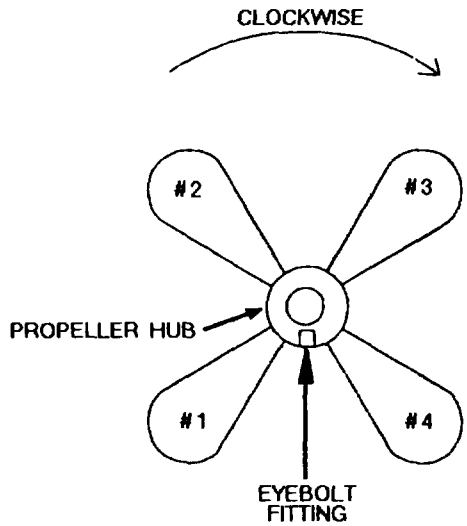
The information section is written to a level consistent with the course content. Reference is made to information in technical manuals or other approved publications.

JOB SHEETS

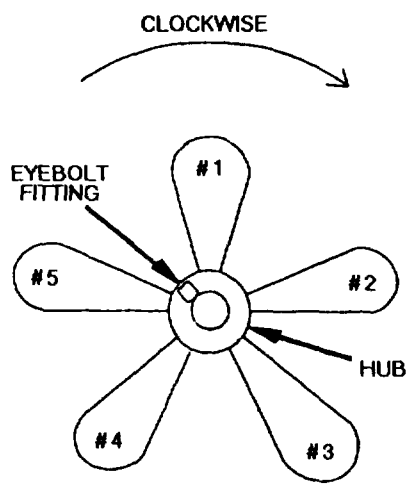
Job sheets (fig. 9-4) direct the students in the step-by-step performance of a practical task they will encounter in their job assignment. Job sheets provide a means for students to apply the knowledge they obtain during instruction through the use of technical documentation in performing the task just as they would on the job. The job sheet is made up of four sections: the introduction, required equipment, references, and job steps.

DIAGRAM SHEET 9 - 1 - 2

BLADED PROPELLERS
(Looking from Stern toward Bow)



4 - BLADED PROPELLER (TYPICAL)



5 - BLADED PROPELLER (TYPICAL)

Figure 9-2. Example Diagram Sheet. (Sheet 1 of 1)

INFORMATION SHEET 4-1-3-1

SAFETY POLICY FOR CONDUCTING TRAINING

A. INTRODUCTION

1. This information sheet is designed to provide you with an understanding of Navy policy regarding training safey.
2. This information sheet covers “Training Time Out” procedures that are to be used during the conduct of this course.

B. REFERENCES

1. CNETINST 1500.20 series, Safety Procedures for Conducting Training in Arduous or Potentially High Risk Activities

C. INFORMATION

1. The mission of the Navy dictates the need for an aggressive training program to prepare personnel to perform professionally and competently in many high risk activities under diverse and possible adverse conditions. Potentially high risk training includes, but is not limited to, training requiring exposure to potentially hazardous conditions involving the environment (water entry, temperature extreme-), atmosphere (fire fighting, use of solvents), explosives (weapons), electrical mechanical or hydraulic training devices or equipments.
2. It is the policy of the Chief of Naval Education and Training (CNET) to provide required training under controlled conditions, within practical and realistic limits, to obtain desired training outcomes while maintaining the maximum margin of safety. Included in this policy is the requirement that in the event a trainee is apprehensive of his personal safety while undergoing training, that concern shall be addressed.
3. TRAINING TIME OUT (TTO)

   Any time a trainee or Instructor has apprehension concerning his personal safety or that of another, he shall verbally signal “TRAINING TIME OUT” to stop the exercise and receive rovide additional instruction as appropriate in accordance with CNEINST 1500.0 series.

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FIGURE 9-3. Example Information Sheet.

JOB SHEET 9-1-5

PLANNING INSPECTION STEPS

A. Introduction

Underwater hull inspection requires a thorough knowledge of the components and conditions peculiar to underwater operations. This Job Sheet will allow you to practice the step-by-step procedures required to conduct underwater hull inspections. A major benefit of this exercise is that you will have the opportunity to make the same decisions that will be required to perform this task in your duty assignment.

B. Equipment The following equipment is required:

1. Open circuit SCUBA outfit.
2. 12" rule
3. Tending lines
4. Hull inspection report
5. Underwater lights (night dives)
6. Chem-lite; one per buddy team (night dives)

C. References

1. NAVSHIPS Technical Manual, and Underwater Work Techniques Manual, Volume 2
2. Underwater Ship Husbandry Manuals, S0600-AA-010 series
3. U. S. Navy Diving Manual, Volume 1

D. Safety Precautions: Review TTO procedures in the Safety/Hazard Awareness Notice.

E. Job Steps. The following job steps apply:

1. At Diving supervisor's direction, dress in open circuit SCUBA following safety checklist in the Underwater Work Techniques Manual Vol. 2, page 3-2.
2. At Diving supervisor's direction, make proper water entry. Review safety checklist in the Underwater Work Techniques Manual, Vol. 2, page 3-3, before entering water.
3. At Diving supervisor's direction, descend on craft and make an unda-water inspection of the craft's hull. Review safety checklist in the Underwater Work Techniques Manual, Vol. 2, page 4-5 before entering water.
4. Upon surfacing, sound off, "Maximum Depth_____, Bottom Time_____." Failure to report this information will result in a failing grade for this Job Sheet.
5. At Diving supervisor's direction, make proper water exit.
6. Await further instructions from Diving supervisor.
7. Complete an underwater hull inspection report (one per buddy team).
8. Two percent will be deducted for each line pull signal not given or given incorrectly.

F. Self Test Questions:

Note: To be developed.

Figure 9-4.-Example Job Sheet.

Introduction

The introduction clearly and concisely describes the purpose of the job sheet and explains what benefits students can expect.

Equipment

The equipment section provides a complete listing of all equipment the students needs to accomplish the job.

References

The references section lists all publications students need to perform the job step portion. Each reference is identified by title, number, volume, and part, as applicable.

Job Steps

The job steps list step-by-step procedures for performing a job. Self-test questions provide students with a self-evaluation of their performance or comprehension of that job step.

PROBLEM SHEETS

Problem sheets (fig. 9-5) present practical problems requiring analysis and decision making similar to those encountered on the job. The problem sheet is an effective means of emphasizing the fundamentals of logical thinking. It is also an effective way to help students learn to problem solve and to help them gain practice in applying their knowledge to practical situations. Each sheet provides a clear statement of the problem, the conditions and parameters affecting the problem, and the directions and procedures for the solution to the problem.

OUTLINE SHEETS

Outline sheets (fig. 9-6) provide an outline of the major discussion points of the topic. The outline sheet allows students to follow the progress of a topic.

PROBLEM SHEET B000-1-24-2
DIAGNOSING GROUP PERFORMANCE

A. INTRODUCTION

The ability to evaluate student and group performance is developed by practice. The purpose of Problem Sheets B000-1-24-2 through 1-24-10 is to provide data for your consideration and allow you to determine why performance was poor. Using the data provided below, diagnose the probable cause(s) of poor group performance.

B. PROBLEM

1. Class No: 041
2. Test:
   a. New: #
   b. Existing:
3. Practice Time:
   a. Scheduled: N/A
   b. Receivcd: N/A
4. Testing Schedule
   a. Day of the week: Wednesday.
   b. Amount of time since last test: One week.
5. Prerequisite Skills: A check of the training background of the class revealed that the students came to class having mastered supporting objectives in previous lessons.
6. Test Item: Passing test score is 63. Test questions and objectives will not be available to you for analysis to determine test item quality, you will only have the data in Items 1-5 and the information in the chart below to determine test item quality.

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Figure 9-5.-Example Problem Sheet. (Sheet 1 of 4)

TEST ITEM MISSED BY CLASS NO.041

	1	2	3	4	5	6	7	8	9	10
STUDENT 1	x		x			x			x	
STUDENT 2					x	x		x		x
STUDENT 3		x				x			x	
STUDENT 4				x	x	x				
STUDENT 5			x				x	x		x
STUDENT 6						x				
STUDENT 7	x	x		x		x				
STUDENT 8		x			x			x	x	
STUDENT 9			x			x	x			x
STUDENT 10	x		x			x	x			

TEST ITEM(S)	OBJECTIVE SUPPORTED
1,2,3	1.1
4, 5	1.2
6, 7, 8	1.3
9	1.4
10	1.5

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Figure 9-5.-Example Problem Sheet. (Sheet 2 of 4)

7. Instruction: N/A

a. Data:

From this instructor's previous class on same test as Class No._

	1	2	3	4	5	6	7	8	9	10
STUDENT 1										
STUDENT 2										
STUDENT 3										
STUDENT 4										
STUDENT 5										
STUDENT 6										
STUDENT 7										
STUDENT 8										
STUDENT 9										
STUDENT 10										

From another instructor's class on the same test.

	1	2	3	4	5	6	7	8	9	10
STUDENT 1										
STUDENT 2										
STUDENT 3										
STUDENT 4										
STUDENT 5										
STUDENT 6										
STUDENT 7										
STUDENT 8										
STUDENT 9										
STUDENT 10										

Figure 9-5.-Example Problem Sheet. (Sheet 3 of 4)

C. PROBABLE CAUSE(S) Put a check mark beside the probable cause(s) of the poor group performance of class No. 041.

1. Incorrect Answer Key: _____
2. Insufficient Practice: _____
3. Poor Test Scheduling: _____
4. Lack of Prerequisite Skills: _____
5. Poor Test Items: _____
6. Poor Instruction: _____

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Figure 9-5.-Example Problem Sheet. (Sheet 4 of 4)

OUTLINE SHEET 9-1-1

UNDERWATER HULL INSPECTION

A. Introduction

Underwater hull inspection involves the examination of the exterior underwater hull and components to determine the condition and needs for maintenance and repair. In this topic, you will be taught the components to be inspected and the procedures for inspection.

B. Enabling Objectives:

7.1 IDENTIFY the components of the ship's hull in accordance with the Underwater Work Techniques Manual, Volume 2.

7.2 DESCRIBE the stages of growth commonly found on underwater hulls in accordance with the NAVSHIPS Technical Manual, Waterborne Underwater Hull Cleaning of Surface Ships, Chapter 081, and the Underwater Work Techniques Manual, Volume 2.

7.3 **STATE** the general contents of the Fouling Rating Scale, and the Paint Deterioration Rating Scale, in accordance with NAVSHIPS Technical Manual and Waterborne Underwater Hull Cleaning of Surface Ships, Chapter 081.

7.4 **DESCRIBE** the fouling areas of hulls in accordance with the NAVSHIPS Technical Manual, Waterborne Underwater Hull Cleaning of Surface Ships, Chapter 081, and the Underwater Work Techniques Manual, Volume 2.

7.5 **APPLY** the safety precautions associated with underwater hull inspections in accordance with the U. S. Navy Diving Manual, Volume 1; the Underwater Work Techniques Manual, Volume 2; and the NAVSHIPS Technical Manual, Waterborne Underwater Hull Cleaning of Surface Ships, Chapter 081.

7.6 PERFORM underwater hull inspections by day in accordance with the NAVSHIPS Technical Manual and Underwater Work Techniques Manual, Volume 2.

7.7 PREPARE the ship's hull inspection report in accordance with the Diving Training Standards.

C. Topic Outline

1. Introduction
2. Ship Hull Components
3. Stages of Sea Growth
4. Fouling Rating Scales
5. Critical Fouling Areas
6. Planning for a Dive
7. Use Repair Safety Checklist
8. Perform Underwater Hull Inspection
9. Hull Inspection Report
10. Summary and Review
11. Assignment

Figure 9-6.-Example outline sheet

INSTRUCTIONAL MEDIA MATERIAL

Some Navy instructors think of instructional media material (MMM) as being synonymous with video tapes. Others think IMM is an instructor crutch to relieve the burden of teaching, and still others consider IMM to be sources of entertainment. Just what is IMM? It is any device or piece of equipment that is used to help the student understand and learn. More specifically, IMM is a specially prepared chart, poster, illustration, video tape, slide picture, motion picture, model, mockup, recording, or piece of equipment that will assist student understanding and expedite learning. Showing is often easier than telling. Utilizing the sense of sight in parallel with hearing creates more effective instruction and greater retention of information by the students.

PURPOSES OF INSTRUCTIONAL MEDIA MATERIAL

The most important purpose of IMM is to increase student understanding. Other important purposes are to increase student retention, interest, and motivation and to provide uniformity in training.

Increases Student Understanding

It is possible and quite probable for a group of students to form entirely different ideas about the same thing as a result of a verbal description. Although you might describe in detail a piece of navigation equipment, such as a sextant, unless the students have seen one, they may develop a completely wrong idea about it. To form a more complete understanding, students need to see the sextant or a model of it to supplement your description.

Students may have problems understanding the proper relationships of the various parts of an object from a verbal explanation only. In the case of the sextant, you would have difficulty making students understand the functions and relationships of the parts without the use of a working model, cutaway, or series of charts. IMM brings subjects into perspective, produces accurate interpretations, and aids in the understanding of relationships.

Increases Student Interest and Motivation

IMM is far more effective in attracting attention and creating interest than a verbal description given without the use of an aid. Use IMM that will capture your students' attention and continue to hold their attention as the lesson progresses.

Students may not be attracted by a description of the various types of small arms; but their curiosity will be aroused immediately by the display of a rifle, pistol, shotgun, or carbine.

Focus the attention and concentration of the entire group on the specific part you are teaching about. Our minds tend to concentrate on the thing upon which our eyes are focused (sense of sight).

The satisfiaction of having done a job well is a feeling familiar to everyone. A similar reaction occurs in a training situation when a student feels the instruction is of definite value. The

student achieves a sense of personal satisfaction from the learning and feels motivated to learn more. You can achieve motivation early in a course of instruction by using IMM. The continued use of IMM to make the instruction concrete and meaningful will sustain student interest and motivation.

Increases Student Retention

Most of people forget what they hear in a relatively short time and have difficulty recalling the information accurately. On the other hand, things they see make a more lasting impression and help them to recall the object or process more accurately. Students can recall the mental images created by pictures and models more easily because of their increased interest at the time of reception. Students have a greater interest in the realistic and concrete than in the symbolic and abstract. The average student will easily forget your verbal explanation of how an internal combustion engine operates. However, an actual engine, a model, or a video tape shown with your explanation will make a fixed impression on students that is easier to recall.

IMM uses the multiple-sense approach to learning to increase retention. The following information supports the importance of using the sense of sight in learning:

STUDENTS WILL RETAIN
10% OF WHAT THEY READ
20% OF WHAT THEY HEAR
30% OF WHAT THEY SEE
50% OF WHAT THEY SEE AND HEAR

Increases Uniformity of Training

In classroom situations in which the instructor uses no aids, student learning depends on the presentation method. While some instructors may express themselves fluently, others may be somewhat inarticulate although they know their subject well. The use of standardized training aids makes the presentations more uniform.

CHARACTERISTICS

All IMMs must have certain characteristics to be effective and to support the purposes for using them. Course developers provide IMMs for established courses. Individual instructors or training sites should not develop their own IMM without the approval of the curriculum control authority (CCA). However, as a classroom instructor, you must know what characteristics IMMs should have. You can then recognize an IMM's shortcomings and recommend changes through the proper chain of command. All IMMs should be accurate, simple, visible, and necessary.

Accurate

First and foremost, visual aids must accurately depict the instructional intent. Use of

outdated or incorrect visuals defeats the purpose of displaying IMM. You cannot adequately explain away inaccuracies--students remember what they see more than what they hear. If your IMM is not accurate, none of the other characteristics will matter.

Simple

The simplest version that will do the job is best. Visual aids that contain unnecessary data confuse students and may arouse their curiosity in a direction contrary to the one intended.

Visible

The IMM must be visible for all students from all areas in the training environment. The two preceding characteristics (accurate, simple) will be of no value unless all students can see all aspects of your visual aid. The use of bold block letters best ensures readability. Readability also depends on the spacing between words and lines, which should be uniform and appropriate to the size of the lettering. You can estimate the size of lettering students can easily see. As a general rule, comfortable reading from the back of a 32-foot long room requires lettering at least 2 inches high.

Necessary

The IMM must support specific learning objectives. It must meet one or more of the purposes for using IMM. Do not use IMM as a time filler just because it is available.

USE OF IMM

When you are going to use IMM, you must plan in advance exactly how it is going to fit into your lesson. The techniques discussed in this section provide clear-cut guidelines for using instructional media materials.

BEFORE THE LESSON

Refer to your lesson plan to determine exactly what IMM you need to support each lesson. Obtain the IMMs you need and then preview each one you plan to use to ensure it is complete, readable, and in a useable condition. Organize the IMMs in the proper sequence. Make sure all needed supporting equipment is available and working. Make proper preparations for the use of IMMs so that you can detect possible problems and make alternate plans if required.

DURING THE LESSON

Display the IMM in a timely manner at the point called for in your lesson plan. Direct the students' attention to specific portions of the IMM either verbally or by using a pointer whwn necessary. After using it to support your lesson, remove it from sight. Use the IMM as naturally as possible. One of the greatest distractions in the classroom is an instructor who

fumbles around with the visual aids.

AFTER THE LESSON

You have a responsibility to your fellow staff members to return all IMMs to the proper storage area in an orderly, organized condition. If you find missing, defaced, or broken items, inform the proper persons to initiate action to correct any discrepancies.

INSTRUCTIONAL TECHNIQUES

The instructional techniques you employ in the use of IMM can greatly add to or distract from their effectiveness. This section provides suggestions on techniques to consider when using the IMM.

Slides

When you are going to use slides to support your lesson, first ensure all slides are in the carousel in the proper sequence, right side up, and not backwards. Preview the entire slide run to verify correctness before going into the classroom to teach. Preview in the classroom where you will teach using the slide projector you will use during the lesson. That allows you to become familiar with the operating controls and characteristics of the slide projector and the physical setup of the classroom. For best visibility, place the projection screen in a corner of the room and angle it toward the center. Check for visibility from all areas of the classroom.

During class, display slides as called for in your lesson plan. Explain each slide as you show it. When you finish your explanation, move on to the next slide or turn the projector bulb off. Use a pointer to direct student attention to specific information on the screen. Be cautious not to block the projector image.

Transparencies

Although transparencies are easy to use, many instructors have problems using them effectively. However, many of the same instructional techniques used for slides also apply to transparencies. Verify correctness before going into the classroom to teach. Become familiar with the operation of the overhead projector and the physical setup of the classroom. Be sure to position the overhead projector so that everyone can see the transparencies. Measure the required height of the screen and the distance of the projector from the screen. Then put a piece of masking tape on the floor so that you can quickly put the projector in the correct position before the class begins.

During your instruction, face the class while talking, but don't stand in front of the screen. Since transparencies can be seen in a regularly lighted room, don't turn off the lights. A darkened room creates an atmosphere in which people sit back and listen passively. You can, however, dim the lights slightly if you want. Keep your transparencies in focus. Place the transparency on the glass before turning on the projector. When showing the transparency, block off unnecessary detail with a piece of paper or a card.

Be sure to move the projector when you have completed showing the transparencies. Don't leave the machine in front of the class unless it is in use it becomes a distraction and a barrier between you and the learners. Don't leave a bare light projected on the screen. Don't be clicking the projector off and on excessively. Turn off the projector when finished. That ensures the class is not left hanging or distracted by a blank screen.

Films/Video Tapes

Motion pictures, which you can show using films or video tapes, present action and can recreate real or imagined situations. The film of the *USS Franklin,* which has been around since 1945, is still shown to make a vivid point about the importance of all-hands damage control training. Using motion pictures in your classroom is not the same as having your students watch a movie. You must view the entire motion picture before class to ensure you are aware of its intent and all key information contained in it. While previewing, become completely knowledgeable of all equipment controls and check for clear visibility from all seating areas.

Before you begin showing the film/tape to your class, introduce it by telling the students specifically what to look for. Develop questions for students to answer after viewing the film/tape. Placing these questions on the visual aids panel or easel chart further focuses student attention to the main thrust. Follow up the film/tape with a discussion of answers to the questions. Having students watch the film/tape is not enough. You must turn it into a learning experience by introducing and summarizing the film/tape for the students.

Newsprint And Wall Charts

Newsprint is another widely used flexible visual aid. It is a powerful tool when used well, but boring and a waste of time when used poorly. In the Navy classroom, you can use it effectively to record, illustrate, or organize information contributed by the class as a lesson takes place. By recording information on newsprint during a class discussion, you can increase class participation, student interest, and motivation.

If you area slow writer or poor speller, using newsprint in a spontaneous manner may hinder your ability to instruct. If you think it will hinder you, prepare or develop newsprint in advance. That allows you to have information neatly arranged and spelled correctly before the class begins. Using newsprint also allows you to maintain your position in front of the students without having to turn away from them to write. When prepared in advance and attached to an easel, you can turn pages over to reveal the new information as the lesson progresses. When using newsprint prepared in advance, make sure you have had ample practice before conducting the class. The following techniques will increase your effectiveness in using newsprint:

- Add tabs to help you turn pages when using the easel.
- Pencil your notes in lightly on the newsprint before you begin the lesson.
- Use brightly colored felt tip markers to write in the words.
- Use dark colors for lettering
- Use various colors to enhance your work and distinguish between information

- Leave the bottom third of your sheets blank to enable the students in the back of the class to see the entire sheet.

You can refer to newsprint at a later date as a review (such as an agenda). For future reference, display your newsprint in a corner of the room or by taping it to the side walls. Place information you have already covered in the back of the room for students to review during their break. Don't clutter the walls with too much information. Remove all unnecessary newsprint to prevent distractions.

You can also use wall charts. They are relatively easy to prepare, and those made of heavy poster board material last a long time. They are versatile in the classroom and easy to display on poster board clips or the easel. By attaching magnetic strips on the back, they easily adhere to most visual aids panels. You can use professionally prepared charts or make them yourself.

To make a wall chart, project an image from an opaque projector on the poster board; trace the outline and then apply colors, titles, and labels as appropriate. Make titles and labels of sufficient height for everyone in the class to see them.

Models, Mockups and Simulators

Models, mockups, and simulators make good sense for many training applications. They can save time and reduce hazards while providing hands-on experience. At the very least, they provide another form of learning reinforcement; at the most, they can help you illustrate and explain things that otherwise would be difficult or dangerous. The model introduces accurate and authentic realism into the learning situation. A model may be an enlargement, a reduction, or the actual six. A scale model represents an exact reproduction of the original. Some models are solid and show only the outline of the object they portray, while others are working models (mockups). Mockups are three-dimensional working models. Use them for training or testing in place of a real object that is too costly, too dangerous, or difficult to obtain.

A simulator is any device that has the form, sound, and even the appearance of the actual equipment. Simulators allow the students to gain "hands-on" experience. You normally use them when they are safer, less costly, or provide better instruction than the actual equipment. Simulators provide a realistic setting and permit a high degree of transfer of learning when the students switch to the actual equipment. Some examples are damage control wet trainers, flight simulators, and submarine control simulators.

Chalkboard/Visual Aids Panel

Two very important visual aids are the chalkboard and visual aids panel (VAP). They are probably the most frequently used visual training aids. You may use them at any time during a lesson to display terms, definitions, examples, problems, drawings, or diagrams. Since most chalkboards and VAPs have a metal backing, you may easily display information on them using poster board with magnets attached. Their flexibility allows you to adapt them to almost any instructional need. Since they are available in most classrooms, labs, and shops, they are an excellent tool for recording student responses, encouraging class involvement, and note taking. You can use the chalkboard/VAP when teaching almost any knowledge subject. The

chalkboard/VAP is essential when you are teaching mental skills involving computations and calculations.

When you plan to use the chalkboard or VAP, you need to take several steps before your presentation. Gather all materials required (chalk or markers, eraser, pointer, straight edges, etc.) for the chalkboard/VAP portion of the lesson and place them in the classroom. Be sure to clean the chalkboard/VAP before using it. Determine what parts of the lesson are important enough to emphasize with board work and will help students meet the objectives. Information should clearly relate to the objectives of the lesson. Also determine the amount of time the board work will take and how it will look when finished. Practice to ensure the information will fit in smoothly with the lesson. That will help you build confidence in using the board and reduce the amount of time you spend erasing and rewriting or redrawing information.

Develop chalkboard/VAP work logically. Sequence the work so the relationship of each new item to the previous is readily apparent. Develop concepts, procedures, diagrams and other information step-by-step and in the most logical sequence. Use the chalkboard/VAP information to develop one point at a time and progress from the simple to the complex. For example, a drawing to illustrate the operation of a basic steam cycle would consist of a boiler, turbine, condenser, pumps, and necessary steam lines. Introducing the students to one component at a time and gradually leading them to the completed cycle supports the law of primacy. It also develops better understanding of the relationships of the components. Write in straight lines. Avoid the natural tendency to write in either an uphill or downhill line. Use color with restraint and only to emphasize key information.

Besides using neat and legible penmanship, make sure you use correct spelling and grammar. Incorrect spelling and poor grammar are not only detrimental to the students, but may discredit you. Check for correct spelling and grammar during practice. To ensure proper spelling and grammar, use lesson plan notes or 3 x 5 cards that correspond with what you plan to write on the board.

Keep all writing or drawings during the lesson brief and to the point. Prolonged writing or drawing disrupts the flow of the lesson and may cause the students to become distracted or bored. Write a comment or draw a portion of a diagram on the board. Then turn to the class to solicit input and generate discussion about the information. This technique promotes good eye contact and encourages class participation.

When preparing a chalkboard/VAP drawing, use some type of drawing aid to keep the drawing as neat as possible. You might use compasses for drawing circles and rulers or T-squares for drawing straight lines. Use templates (shapes cut from poster board) that you can trace onto the chalkboard/VAP if you plan to use the drawing often.

If using a pointer to draw attention to a point or drawing, keep your arm straight while pointing. Consider the pointer as an extension of your arm. Use the hand nearest the object you point out instead of allowing your arm to cross your body. Stand to one side to prevent obstructing the students' view, and avoid talking to the chalkboard/VAP. When you talk to the board, students have difficulty understanding your words, and you lose eye contact. Pause frequently to maintain student attention. Explain what you are doing and check for student reaction. Additionally check the drawing or writing from the students' viewpoint.

During your presentation, keep the board as clean as possible. Erase all information you are not using. A cluttered board with scattered, unrelated materials hinders your presentation and student understanding. Put the eraser back in the dust tray when you finish making your point. Do not cause a distraction by carrying it around. Also, you should avoid walking in front of displayed information whenever possible. As with other forms of IMM, erase or cover the chalkboard/VAP work as soon as you finish the presentation to prevent it from becoming a distraction.

SUMMARY

To be an effective instructor, you must be familiar with the materials required to teach the course of instruction. You must use the approved lesson plan and personalize it to cover all discussion points exactly as you intend. Use instruction sheets to reinforce your lesson presentations and to provide students with the learning opportunities provided by these materials. When using instructional media materials, prepare the materials in advance, practice your use of the materials, and follow proper techniques when using these materials in the learning environment. The proper use of all course materials will greatly enhance your effectiveness as an instructor.

The effective use of IMM is not limited to any one phase of the instructing-learning process. You can use films, video tapes, slides, and transparencies to add interest as well as to supplement verbal explanations. Posters and newsprint make discussions more realistic and interesting. Models, mockups or simulators enhance demonstrations. Remember, IMM give meaning to the instruction, but they cannot take the place of effective instruction.